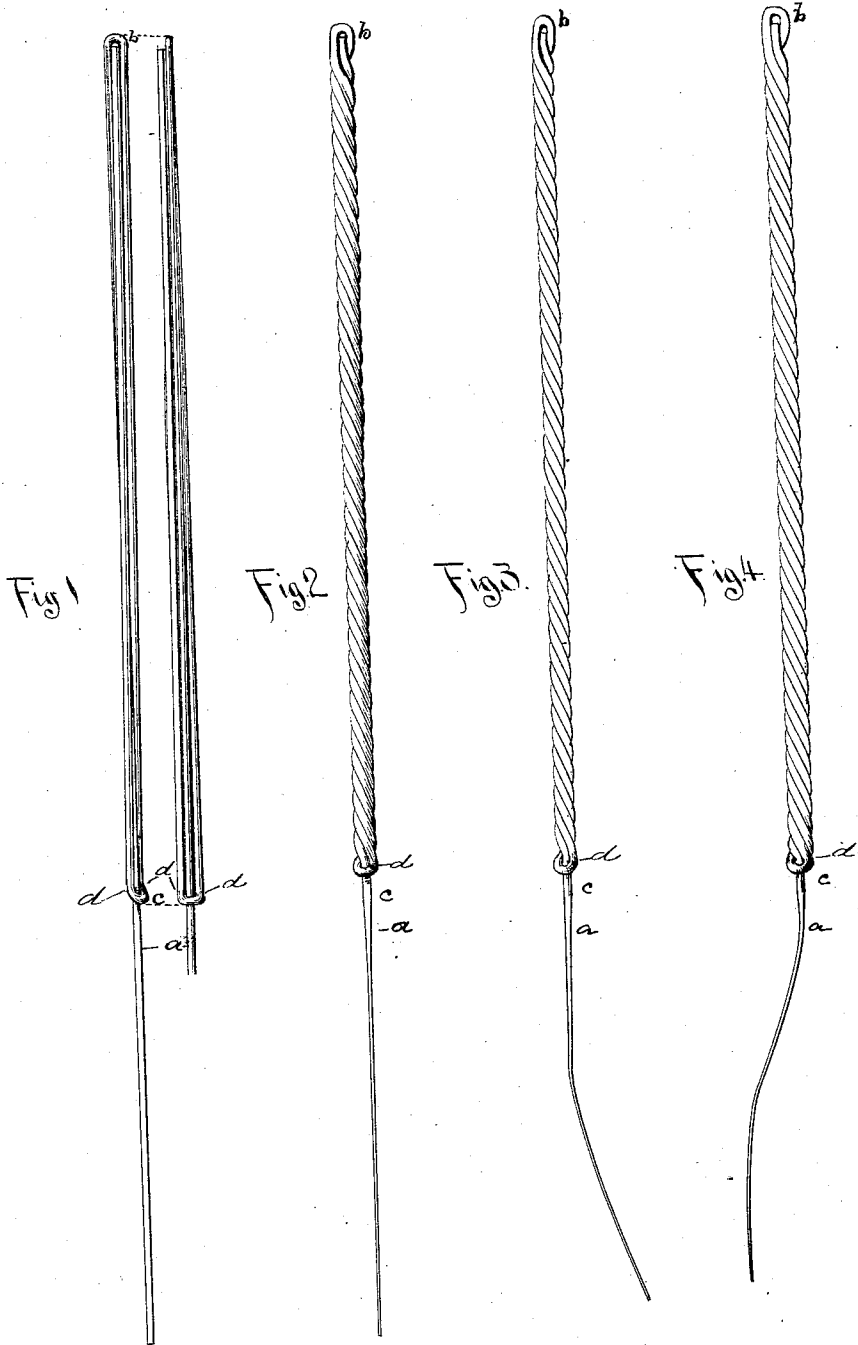


(No Model.)

R. B. DONALDSON.
DENTAL INSTRUMENT.

No. 318,173.

Patented May 19, 1885.



Witnesses
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UNITED STATES PATENT OFFICE.

ROBERT BRUCE DONALDSON, OF WASHINGTON, DISTRICT OF COLUMBIA.

DENTAL INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 318,173, dated May 19, 1885.

Application filed February 14, 1885. (No model.)

To all whom it may concern:

Be it known that I, ROBERT BRUCE DONALDSON, of the city of Washington, in the District of Columbia, have invented a new and useful Improvement in Dental Instruments; and I do hereby declare that the following is a full and accurate description of the same.

When it becomes necessary to extirpate the pulp in a diseased tooth it also becomes necessary to fill the pulp-canal to the apex of the root, and, as it is desirable to avoid unnecessary enlargement of said canal, a very delicate instrument is required to reach as near to the apex of the root as is required in filling the pulp-canal, and the problem has been to procure an instrument which, when reduced to the required dimensions, will still retain serviceable stiffness, and at the same time permit of being bent to such form as may be required to reach and traverse the pulp-canal whatever may be its position or direction, while the handle of the instrument remains outside the mouth.

"Pulp-canal pluggers" or "root-filling instruments" have heretofore been made each of a piece of soft steel of proper length and of the diameter required for the handle of the instrument, the blade being formed by filing down one of the extremities to the requisite length and diameter. For the most part they have been left untempered by the manufacturers, in order that they may be bent into the form required for any particular operation, it having been found impracticable to obtain just the requisite hardness and elasticity by tempering without the liability to break in the frequent bending and straightening processes to which in ordinary use the instrument is subjected.

I have discovered that the desired qualities are possessed by metallic alloys like piano-wire steel, which, when reduced to the delicate diameter requisite, may be bent and rebent without danger of breaking, will retain the desired curve, and still possess a degree of elasticity and sufficient stiffness for the purpose; but these delicate instruments are necessarily frail when not properly tempered, and will endure under the most favorable circumstances but a short time. The question of cost as well as of adaptability therefore becomes important. It is necessary that the blade shall be firm in the handle, and therefore a handle and blade made separately—the

latter inserted in the former—or a gripping handle of any sort are much more costly. The use of a gripping-handle makes it necessary for the operator to partly fit the tang end of each blade. It is therefore cheaper and better to make the blade and handle integral from a single piece of suitable wire, and for this purpose piano-wire has been found excellently well adapted.

In the accompanying drawings, Figure 1 represents my invention in the first stage of its manufacture. Fig. 2 represents the completed instrument. Figs. 3 and 4 illustrate the different forms in which the blades may be bent.

A piece of wire, *a*, is folded upon itself, as at *b c*. For my own use, I prefer piano-wire about twenty gage, with three folds, as shown. At the bends *b c* the diameter of the curve is equal to the diameter of the wire, so that the bend will just accommodate the thickness of the wire. At the bend *c* the fold has given to it an outward deflection, as shown at *d*, just sufficient to permit the blade part to rest in the same plane with the other parts. The extremities of the folds are then clamped and the whole twisted together, as in Fig. 2, and the handle is complete. If a handle of larger diameter is desired, an additional length of wire and an additional number of folds may be employed. The blade may be bent in any direction, and with any curvature to reach a pulp-canal, however situated. The blade is to be reduced by the file or by grinding to the desired degree of attenuation.

In bending the blade to impart to it the desired direction, it should be subjected to pressure between the thumb and finger, and thus avoid the sharp angles which will be liable if the bending is effected with pliers.

Having described my invention, I claim as new—

1. A pulp-canal plugger formed from wire capable of being bent as desired, the blade portion being reduced to the desired attenuation and the handle formed by twisting together two or more folds of the wire, as set forth.

2. A pulp-canal plugger formed from steel piano-wire, the blade and handle formed from a single piece with the folds and bends *b c d*, and the parts twisted together, as set forth.

Witnesses: ROBERT BRUCE DONALDSON.

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